भारतीय मानक
Indian Standard

IS 5777 : 2022

एलपीजी के साथ प्रयोगार्थ फ्राइअर — विशिष्टि

(पहला पुनरीक्षण)

Fryers for Use with LPG — Specification

(First Revision)

ICS 97.040.20

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Domestic and Commercial Gas Burning Appliances (Pressure Type) Sectional Committee, MED 23

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on the recommendation of the Domestic and Commercial Gas Burning Appliances (Pressure Type) Sectional Committee, and approved by the Mechanical Engineering Divisional Council.

This standard was first published in 1970. This standard is being revised again to keep pace with the latest technological developments and international practices. In this revision, the following major changes have been made :

a) A reference clause has been added mentioning the latest version of all the referred standards.

b) Editorial corrections have been done.

This standard is one of a series of Indian Standards on various domestic and commercial gas burning appliances (pressure type) used with liquefied petroleum gases (LPG). General requirements of this equipment are covered in IS 5116 : 2020 Domestic and Commercial Equipment for Use with LPG — General Requirements ', which is a necessary adjunct to this standard. Should, however, any deviation exist between the requirements given in IS 5116 and those given in this standard, provisions of the latter shall apply. Other standards published so far in the series are IS 4246 : 2002 'Domestic gas stoves for use with liquefied petroleum gases — Specification (fifth revision)', IS 15558 : 2005 ‘Mini domestic water heater for use with LPG — Specification’, IS 4473 : 2002 'Domestic gas ovens for use with liquefied petroleum gases (first revision)' and IS 11480 : 1998 'Domestic grillers for use with liquefied petroleum gases — Specification (first revision)'. Specification for bulk water heater for use with liquefied petroleum gases (LPG) covered in IS 5776 : 1988 'Bulk water heaters for use with LPG (first revision)'.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

FRYERS FOR USE WITH LPG — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard covers the requirements for fryers, of the type used in restaurants and catering establishments for frying fish, chips and doughnuts, for use with LPG at a working pressure of 2.942 kN/m^2 (30 gf/cm^2).

1.2 This specification does not apply to fish frying ranges such as are generally used in fish and chip shops.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. In case the standards are to be referred in this clause they are to be listed as follows:

IS No.	*Title*
544 : 2014	Groundnut oil — Specification (*third revision*)
5116 : 2020	Domestic and commercial equipment for use with LPG — General requirements (*fourth revision*)
6480 : 1988	Glossary of terms relating to domestic and commercial gas-burning appliances (first *revision*)

3 TERMINOLOGY

3.1 For the purpose of this standard, relevant definitions given in IS 6480 shall apply.

4 MATERIAL

4.1 The material shall conform to the relevant requirements specified in Section 1 of IS 5116.

5 CONSTRUCTIONAL REQUIREMENTS

In addition to the relevant provisions of Section 1 of IS 5116, the requirements specified in **5.1** to **5.3** shall apply.

5.1 Means shall be provided to limit the maximum temperature of the frying medium to 185 °C or to such other lower figure as may be stated by the manufacturer. This shall preferably be achieved by the incorporation of a thermostat, so that the operating temperature can be controlled.

5.2 The pan shall be fitted with a full-bore draw-off tap, suitably marked and protected against inadvertent operation. The tap and pipe work shall have an internal diameter of a minimum 12 mm and shall be capable of completely draining off the pan and of being easily cleaned.

5.3 The flames of each individual burner shall be stable at the heat input required to maintain the frying medium in the pan at 150 °C and shall light across from all ports or jets at full gas rate.

6 PERFORMANCE REQUIREMENTS

In addition to the relevant performance requirements specified in Section 2 of IS 5116, requirements given in **6.1** to **6.4**, tested under ambient temperature 20 to 30 °C, shall apply.

6.1 Combustion

When sampled as detailed in **6.1.1** the carbon monoxide/carbon dioxide ratio of the products of combustion shall not exceed 0.02 at any rate between the minimum operational rate and prescribed overload rate. This requirement shall be achieved for pressures from 2.452 to 3.432 kN/m^2 (25 to 35 gf/cm^2). Tests shall be made at a sufficient number of heat input rates to determine the combustion performance over the whole of the prescribed range.

6.1.1 The frying pan shall be filled with water to the depth recommended by the manufacturer, the gas lit at full ‘ON’ rate and a sample of the products of combustion drawn from the flue outlet after 15 minutes. The thermostat, if any, shall be set at maximum setting. During the 15 minutes preceding the commencement of sampling there shall be no evidence of incomplete combustion.

6.2 Heating

When tested according to Annex A, the time required to raise the temperature of the oil by 165 °C shall not exceed 30 minutes.

6.3 Cooking

The appliance shall pass the cooking test as prescribed in Annex B.

6.4 Surface Temperature

The requirements specified in **23** of IS 5116 shall be complied with, any variable thermostat on the appliance being set to maintain the maximum oil temperature recommended by the manufacturer, or 185 °C in the absence of such recommendation, and the gas turned full ‘ON’.

7 INSTRUCTIONS

7.1 The appliance shall be accompanied by an instruction sheet with the relevant instructions given in **24** of IS 5116.

8 MARKING

8.1 Each appliance shall be legibly and indelibly marked with the following:

a) Manufacturer’s name, initials or registered trade-mark;

b) Type number or name which differs from that of other models for other fuels, that is, coal gas or natural gas;

c) The words ‘for use with butane/propane at 2.942 kN/m^2 (30 gf/cm^2)’;

d) Any special instructions for the safe operation;

e) Country of origin; and

f) Temperature chart corresponding to the thermostat settings, if thermostat is provided.

8.1.1 The information given in **8.1** shall be distinct, permanent and easily accessible when the appliance is installed as it would be in service.

8.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

9 PACKING

9.1 The method for packing shall be such as to minimize the damage to the appliance in transit. If governors or relay controls are unavoidably supplied loose, moving parts shall be clamped with the valve in the open position and the inlet and outlet shall be plugged.

9.1.1 All open pipe ends and connection openings shall be suitably plugged, and sealed to prevent the entry of extraneous matter.

ANNEX A

(*Clause* 6.2)

HEATING TEST

A-1 OBJECT

A-1.1 To determine the time and gas required to raise the temperature of the oil by 165 °C.

A-2 METHOD

A-2.1 Fill the pan with oil to the depth recommended by the manufacturer. Set the thermostat, if fitted, to its maximum temperature. Take readings of the temperature of the oil 25 mm below the surface at the centre of the pan at intervals of 1 minute until a temperature rise of 165 °C is attained. Record the total gas used during the heating period.

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A-3 REQUIREMENT

A-3.1 The time required for heating up shall not exceed 30 minutes.

ANNEX B

(*Clause* 6.3)

COOKING TEST

B-l PROCEDURE

B-l.1 The cooking quality and gas requirement shall be determined by frying chips.

B-1.2 Selection of materials: Potatoes (Majestic or Arran Pilot) Frying oil (groundnut) (*see* IS 544)

B-2 PREPARATION OF MATERIALS

The potatoes shall be peeled, cut into chips 10 mm square section and dried in a cloth.

B-2.1 Quantity of Food **—**The test consists of cooking a number of equal batches of chips, the weight of the batches being that recommended by the manufacturer. The oil shall reach the level recommended by the manufacturer.

B-3 METHOD OF TEST

If a thermostat is fitted, set it to the temperature recommended by the manufacturer, or to 185 °C in the absence of such recommendation, and light the gas. When the oil reaches this temperature, lower the chips carefully into it and record the time and gas reading. Record the temperature of oil at intervals throughout the test. When no thermostat is fitted leave the gas full ‘ON’ during the frying unless the oil temperature exceeds 185 °C. Remove the chips when cooked, note the time and gas meter reading and allow the temperature of the oil to recover to the operating temperature. Lower a Further batch of chips into the oil and repeat the procedure. Cook sufficient batches of chips to enable the hourly production to be determined. At the end of the last batch bring the oil back to the operating temperature. Turn the gas off and note the time and gas meter reading.

B-4 REQUIREMENTS

a) The chips shall be cooked.

b) The time per batch shall not exceed 10 minutes.

c) The production rate in kilogram per hour, excluding the heating up time, shall be recorded as the weight of the peeled and chipped potatoes used.

d) The gas consumption (excluding heating up) per kg of chips shall not exceed 1800.3 kJ (430 kcal).

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Domestic and Commercial Gas Burning Appliances Sectional Committee, MED 23

Organization	*Representative(s)*
L.P.G. Equipment Research Centre, Bengaluru	SHRI ASHISH BERA (***Chairman***)
Agnisumukh, Bengaluru	SHRI HARI RAO
BSH Household Appliances Manufacturing Private Limited, Chennai	SHRI VIJAY KUMAR LOGANATHAN
Bharat Petroleum Corporation Limited, Mumbai	SHRI SUDIPTA SARKAR SHRI MOHIT RANE (*Alternate*)
Bureau of Energy Efficiency, New Delhi	MS PRAVATANALINI SAMAL SHRI KAMRAN SHAIKH (*Alternate*)
Delton Industries, New Delhi	SHRI R.C.NANGIA SHRI VIVEK NANGIA (*Alternate*)
Directorate General of Quality Assurance (Stores), Kanpur	SHRI H. H. P. TIWARI
Gorani Industries Limited, Indore	SHRI ANIL GORANI
Goyal Engineers Private Limited, New Delhi	SHRI AJAY GOYAL SHRI NEERAJ GOYAL (*Alternate*)
Hindustan Petroleum Corporation Limited, Mumbai	SHRI DILIP KUMAR RAY SHRI SIVA SHANKAR (*Alternate*)
Kabsons Gas Equipment Pvt. Ltd., Hyderabad	SHRI SATISH KABRA SHRI KUNAL KABRA (*Alternate*)
Indian Institute of Petroleum, Dehradun	SHRI PANKAJ KUMAR ARYA
Indian Institute of Technology Guwahati, Guwahati	SHRI MUTHU KUMAR
Indian Oil Corporation (Marketing), Mumbai	SHRI J SHYAM SWAROOP

Organization	*Representative(s)*
Indraprastha Gas Limited, New Delhi	SHRI BHUDEV SINGH SHRI K. C. DEWANGAN (*Alternate*)
L.P.G. Equipment Research Centre, Bengaluru	SHRI P. R. DEODHAR SHRI RAHUL SHARMA (*Alternate*)
Petroleum Conservation Research Association, New Delhi	SHRI SURENDRA PRATAP
Ariston Thermo India Private Limited, Pune	SHRI ABHIJIT BANSHELKIKAR SHRI MAHESH BHANGALE (*Alternate*)
Rama Domestic Appliances, New Delhi	SHRI AMARJEET SINGH KOHLI SHRI MANMOHAN KRISHNAN (*Alternate*)
Shri Krishna Test House, New Delhi	SHRI SUNILTALWAR
Sunflame Enterprises Private Limited, Faridabad	SHRI K. L. VERMA SHRI SANDEEP JUNEJA (*Alternate*)
Superflame Enterprises Private Limited, Faridabad	SHRI VIKRAM VERMA
Vanaz Engineers Limited, Pune	SHRI A. A. TAMBOLI SHRI V. N. PUJARI (*Alternate*)
In Personal Capacity [*S-139, Greater Kailash-I (1st & 2nd Floor), New Delhi — 110048*]	SHRI M.K. GUPTA
BIS Directorate General	SHRI RAJNEESH KHOSLA, Scientist 'E' And Head (MED) [Representing Director General (*Ex-Officio*)]

Member Secretary
SHRI SANDEEP KESHAV
Scientist 'C' (MED),
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